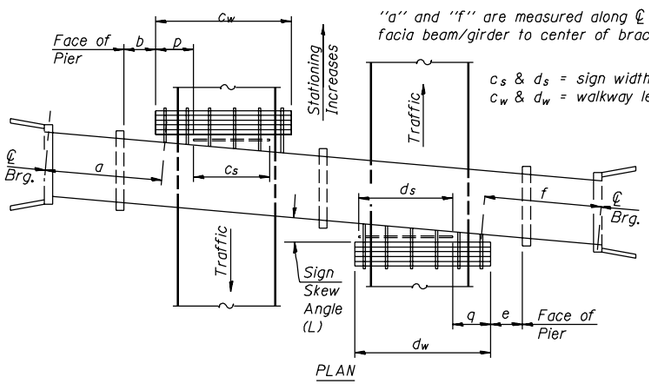
CELL / MODEL NAME	DESCRIPTION	DATE
BM-1	General plan and elevation	7/1/2006
BM-2	Walkway and connection details	7/1/2006
BM-3	Connection details	7/1/2006
BM-4	Walkway details	7/1/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

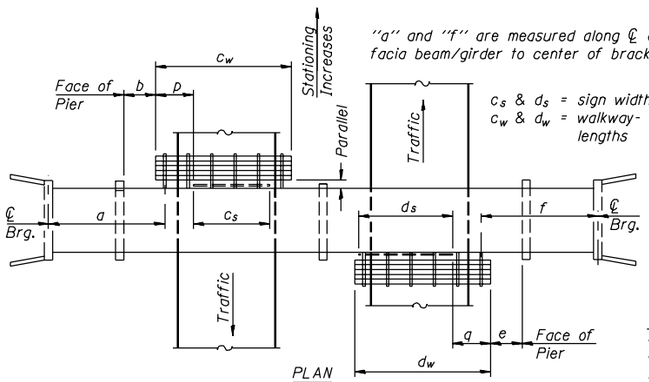
SHEET NO. - - SHEETS

Contract #



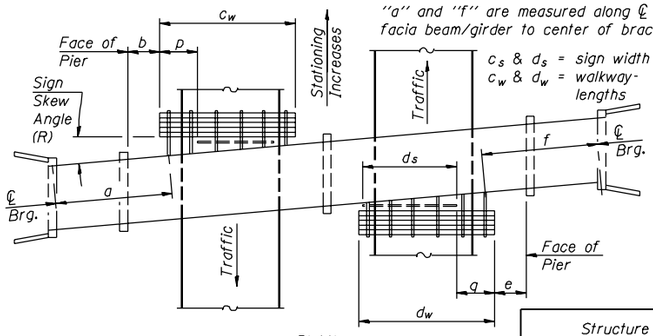
WALKWAY AND HANDRAIL SKETCH

(Road plan beneath structure varies.)



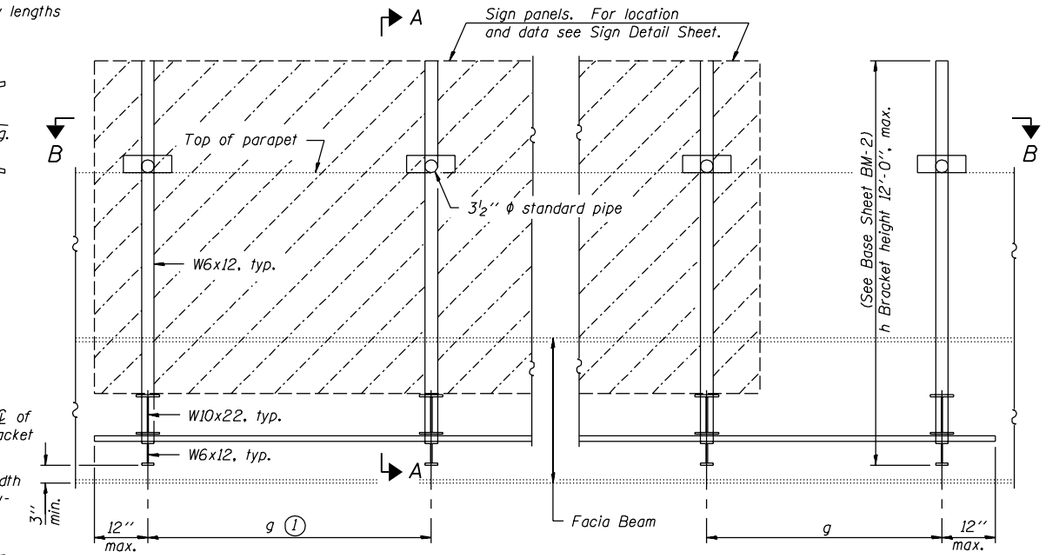
WALKWAY AND HANDRAIL SKETCH

(Road plan beneath structure varies.)



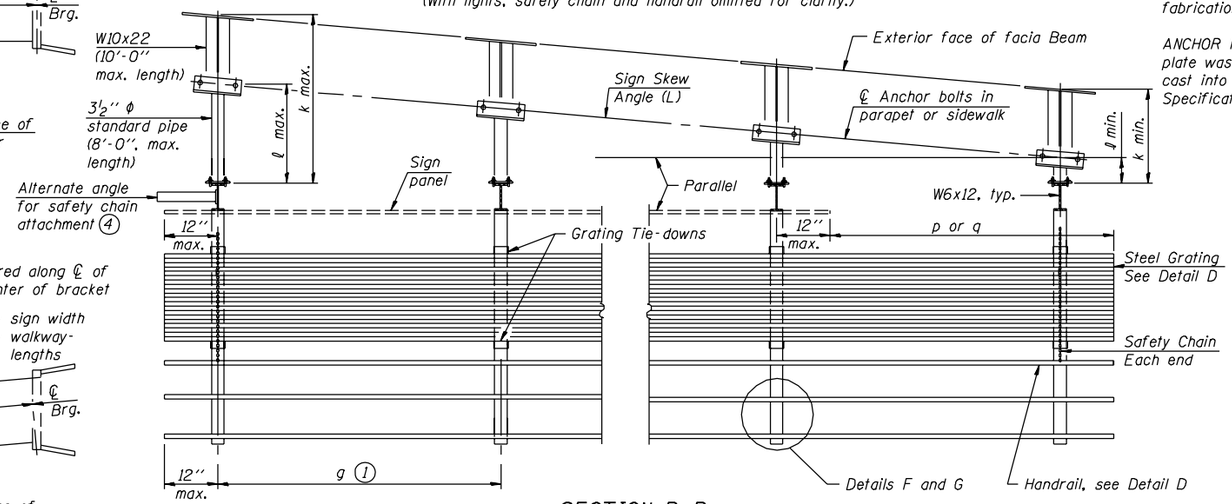
WALKWAY AND HANDRAIL SKETCH

(Road plan beneath structure varies.)



TYPICAL FRONT ELEVATION

(With lights, safety chain and handrail omitted for clarity.)



SECTION B-B

(Shown: Left Sign Skew > 15°)

GENERAL NOTES

SPECIFICATIONS:

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications") (2)

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY

WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

MINIMUM CLEARANCE: 3" greater than bridge members at all locations. (All Obstructions)

WELDING: All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 Structural Welding Code (Steel) and the Standard Specificiations.

MATERIALS: All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.
All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 (M183, M223 Gr. 50,).

HIGH STRENGTH BOLTS: All bolts, washers, nuts and locknuts shall satisfy the requirements of ASTM designation A307 unless noted as "H.S." which shall require AASHTO M164 (A325), ASTM A449, or approved alternate. All fasteners shall be hot dip galvanized per AASHTO M232 unless otherwise specified.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: All-threaded rod conforming to ASTM A307, $\frac{3}{4}$" ϕ x 12" long, each with one plate washer and locknut and be hot dip galvanized per AASHTO M232. They shall be either cast into the concrete or epoxy grouted in accordance with Section 584 of the Standard Specifications. Minimum embedment in concrete shall be 9".

(1) Bracket spacing g ≤ 6'-0", max. Spacing shall be uniform if possible but may vary ±6" to miss existing obstruction (rail post, light poles, web stiffeners, splice plates, etc.). Adjust bracket lengths accordingly on skewed structures.
(2) Any design modifications shall be based on the current version of applicable specifications and submitted for the Engineer's approval.
(3) Unit price includes grating, handrail, brackets, supports, anchor bolts, fasteners, fabrication, delivery, erection, field drilling and other necessary items. Limits of payment are based on grating length (cw, dw) unless otherwise specified. For Safety Chain Details and Details D, F and G, see Base Sheet BM-4.
(4) If walkway bracket at safety chain location is behind sign, add angle to bracket. See detail on Base Sheet BM-4.

NUMBER	REVISION	DATE

TOTAL BILL OF MATERIAL

(3) OVERHEAD SIGN STRUCTURE - BRIDGE MOUNTED	Foot	

Structure Number	Sign Skew Angle (L) or (R)	Bridge Station	Bridge Structure Number	Contract Route Designation	a	b	c_s	c_w	d_s	d_w	e	f	g	No. of Brackets (Total)	p	q	Total Grating/ Hndrl. Lengths (c_w + d_w)

Dimensions a, b, e, f & g may vary as approved by the Engineer, see (1).
When c_w < c_s and/or d_w < d_s, use alternate brackets without walkway supports where applicable, see (3).

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

BM-1 7/01/2006

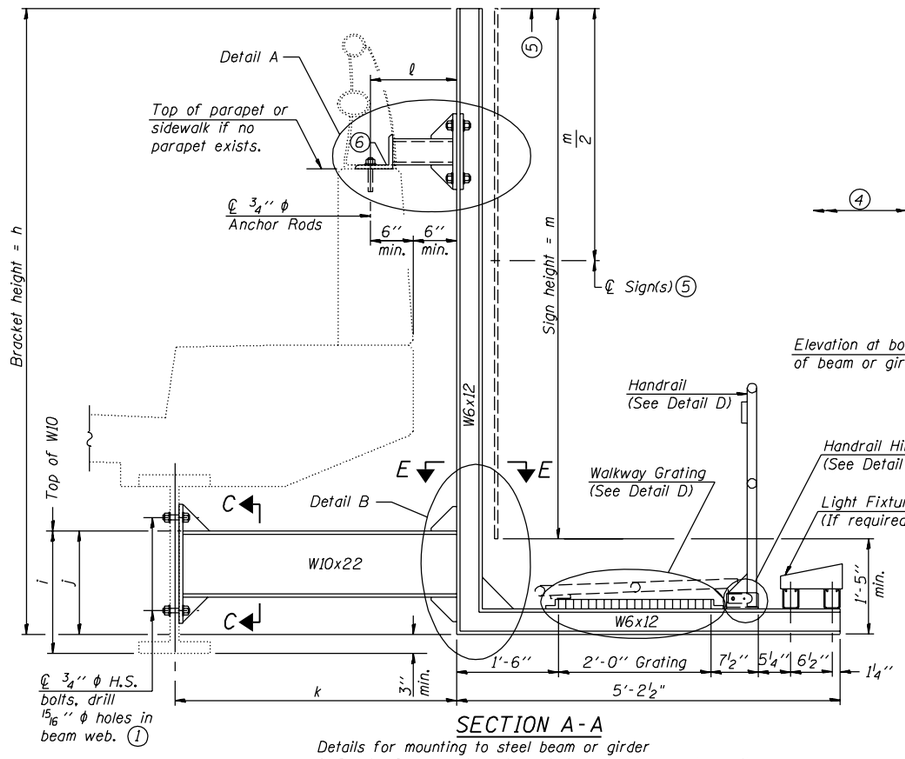
BRIDGE MOUNT SIGN STRUCTURES GENERAL PLAN AND ELEVATION

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

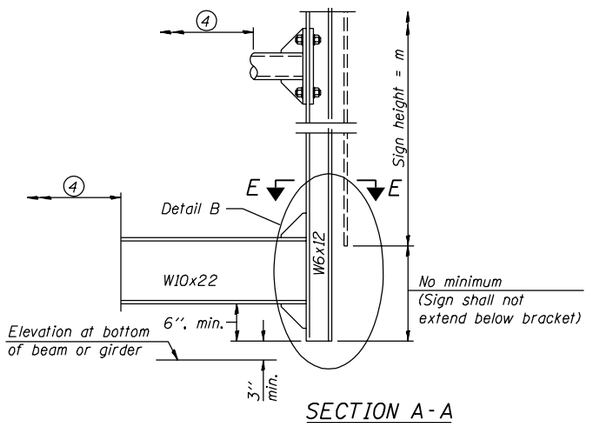
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

Contract #

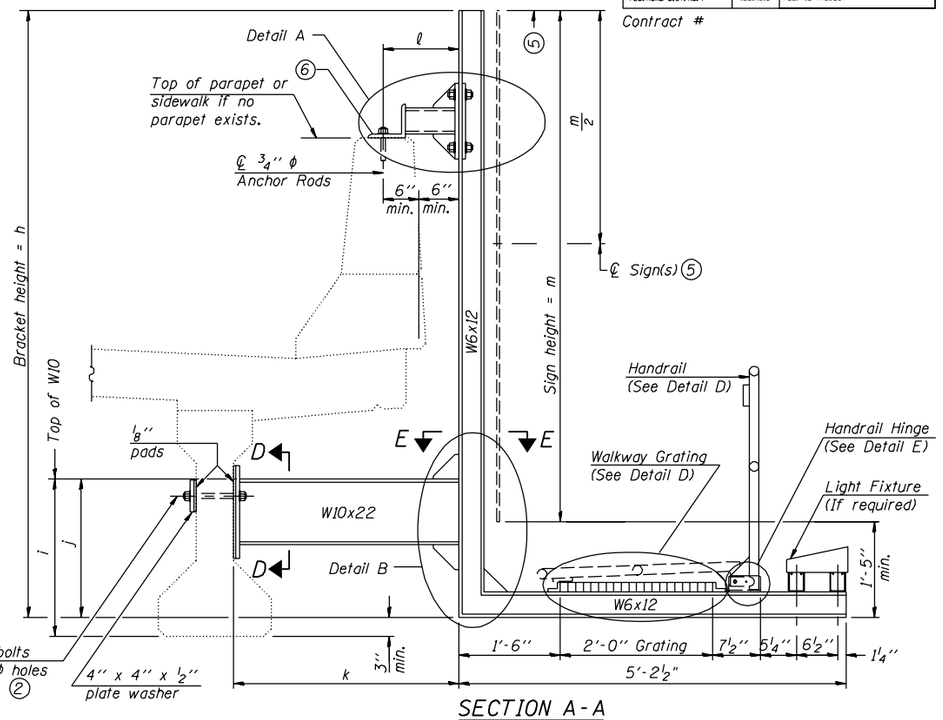


SECTION A-A
Details for mounting to steel beam or girder
& Details for mounting with existing parapet mounted rail



SECTION A-A
Alternate with no lights or walkways

(4) For attachment details of 3½" pipe and W10x22, see other sections as applicable.



SECTION A-A
Details for mounting to PPC I Beam or Bulb "T"
& Details for mounting to parapet w/o rail

Structure Number	Station	h	i	j	k max. (10'-0" max.)	ℓ max. (8'-0" max.)	m (15'-0" max.)

For Details A & B, Sections C-C, D-D and E-E, see Base Sheet BM-3.
For Details D & E, see Base Sheet BM-4.

(1) Holes in new steel members may be drilled in the fabrication shop or in the field. Field drill existing members.

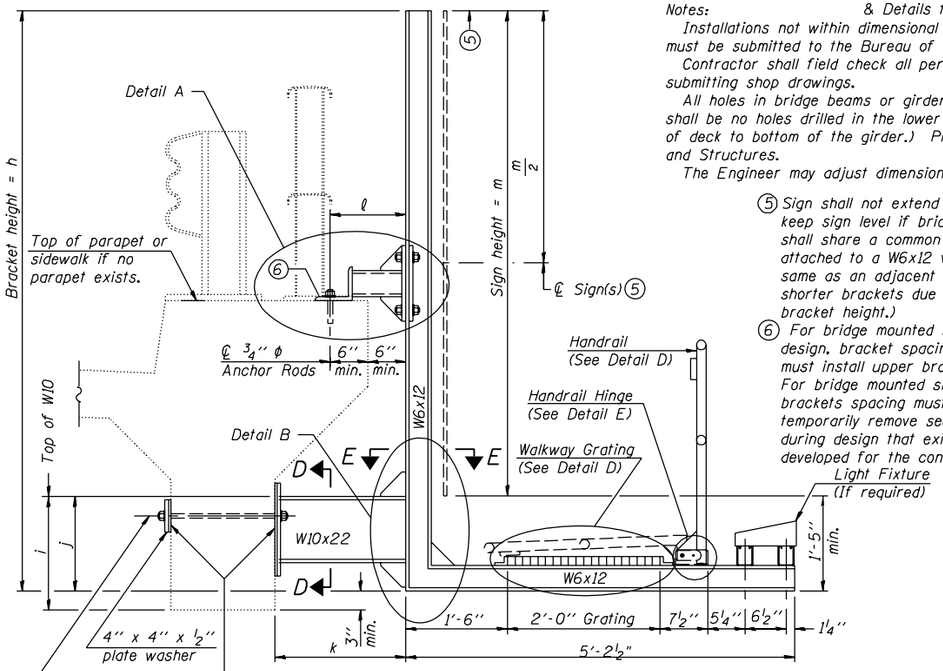
(2) For new PPC I beams, holes shall be formed during casting. For existing PPC I beams, prestressing strand locations shall be determined and spaced to miss strands by 6", min. Minimize spalling during field drilling of existing beams.

(3) For new construction, form holes. For existing RC beams, locate primary reinforcement and space holes to miss by 6", min. Minimize spalling and concrete fracturing/damage during field drilling of existing concrete. Spalls over ¼" deep or beyond the coverage of the 4x4 plate washer shall be repaired with epoxy mortar before installing washer.

Notes:
Installations not within dimensional limits shown require special analysis for all components and must be submitted to the Bureau of Bridges and Structures for approval.
Contractor shall field check all pertinent existing bridge dimensions shown on plans before submitting shop drawings.
All holes in bridge beams or girders should be located in the middle half of the member. There shall be no holes drilled in the lower quarter of the member's depth. (For R.C. girder, depth = bottom of deck to bottom of the girder.) Proposed exceptions must be approved by the Bureau of Bridges and Structures.
The Engineer may adjust dimension "i" to meet the above condition and to keep the sign level.

(5) Sign shall not extend more than 6" above top of bracket, and this dimension may vary to keep sign level if bridge is on grade or vertical curve. Multiple signs of various heights shall share a common horizontal centerline and use equal bracket heights. If no sign is attached to a W6x12 vertical (bracket only supporting walkway), dimension h shall be the same as an adjacent bracket with a sign attached, unless Engineer specifically directs shorter brackets due to locational restraints on future uses. (See Detail A for minimum bracket height.)

(6) For bridge mounted sign structures installed on new bridges with railing, during design, bracket spacing must be coordinated with railing post spacing and the Contractor must install upper brackets prior to railing installation.
For bridge mounted sign structrues installed on existing bridges with railing, during design, brackets spacing must be coordinated with railing post spacing and the Contractor must temporarily remove sections of railing to facilitate upper bracket installation. If it is determined during design that existing railings can't be removed, alternate upper connection details must be developed for the contract plans and approved by the Bureau of Bridges and Structures.



SECTION A-A
Details for mounting to integral reinforced concrete girder
& Details for mounting on safety curb with surface-mount bridge rail

NUMBER	REVISION	DATE

BRIDGE MOUNT SIGN STRUCTURES
WALKWAY AND CONNECTION DETAILS

DESIGNED -	- 200
CHECKED -	EXAMINED
DRAWN -	ENGINEER OF BRIDGE DESIGN
CHECKED -	PASSED
	ENGINEER OF BRIDGES AND STRUCTURES

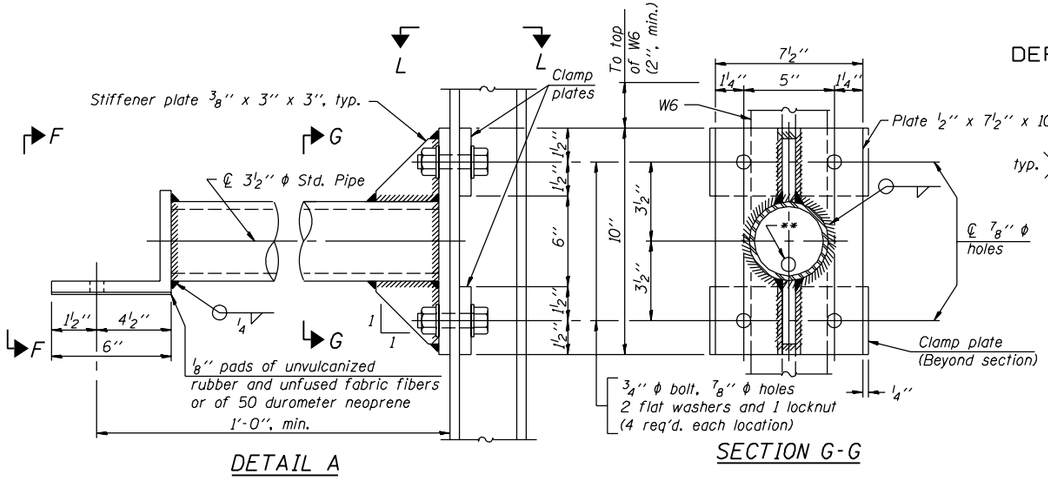
BM-2 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

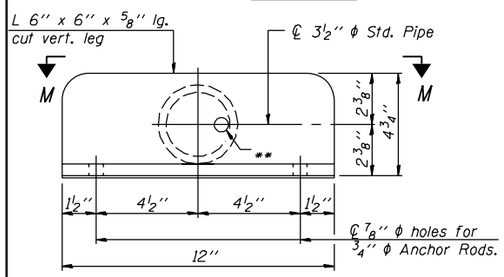
SHEET NO. - - SHEETS

Contract #

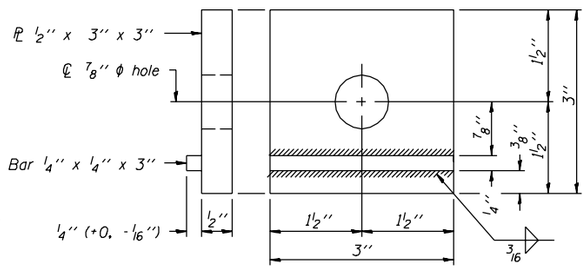


DETAIL A

SECTION G-G

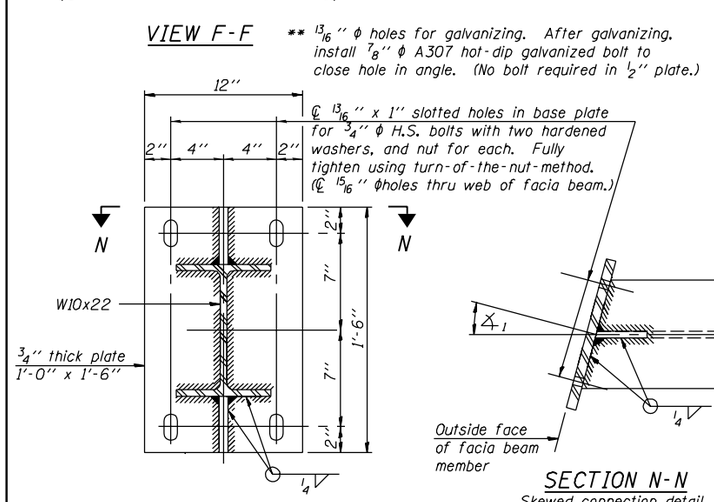


VIEW F-F



CLAMP PLATE DETAILS

** 13/16" ϕ holes for galvanizing. After galvanizing, install 7/8" ϕ A307 hot-dip galvanized bolt to close hole in angle. (No bolt required in 1/2" plate.)



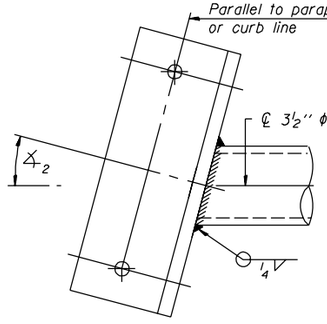
SECTION C-C

Steel beam or girder connection plate details

SECTION N-N

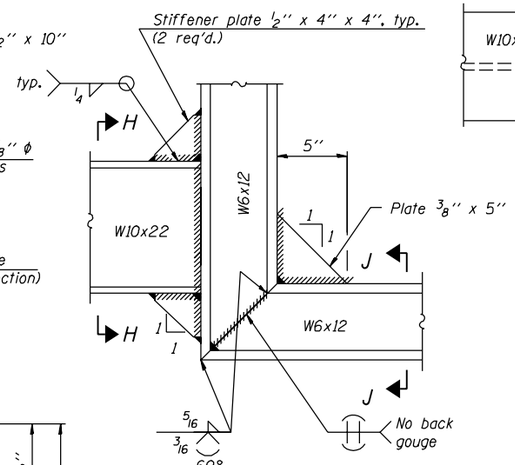
Skewed connection detail for W10x22 to facia beam.

Note: For constant slab overhang at facia beam, ∠1 = ∠2 = sign angle. For flared beams or other special cases where ∠1 ≠ ∠2, ∠1 = sign angle.

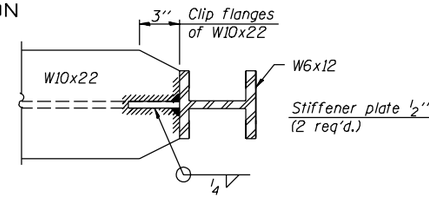


SECTION M-M

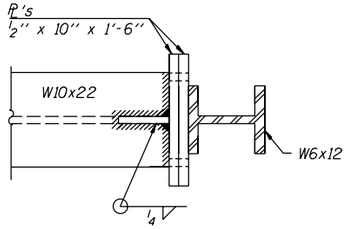
Skewed connection detail for 3 1/2" ϕ pipe to parapet.



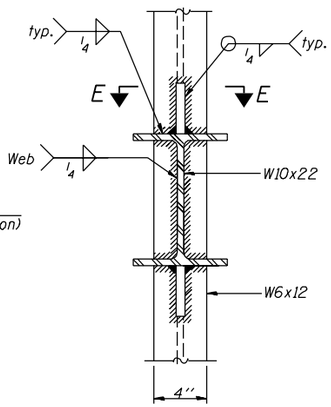
DETAIL B - WELDED W10x22 TO W6x12 CONNECTION



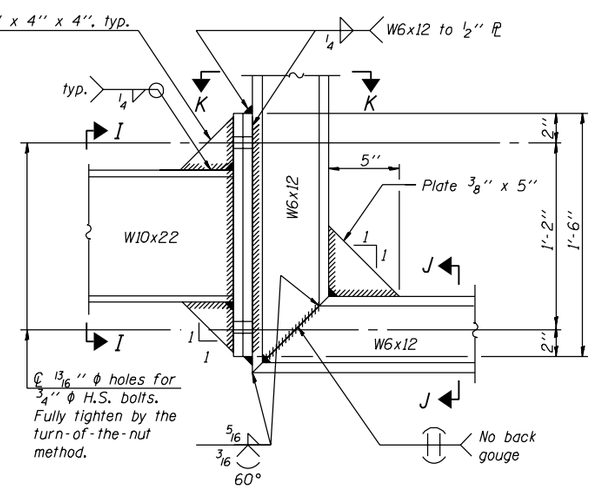
SECTION E-E



SECTION K-K

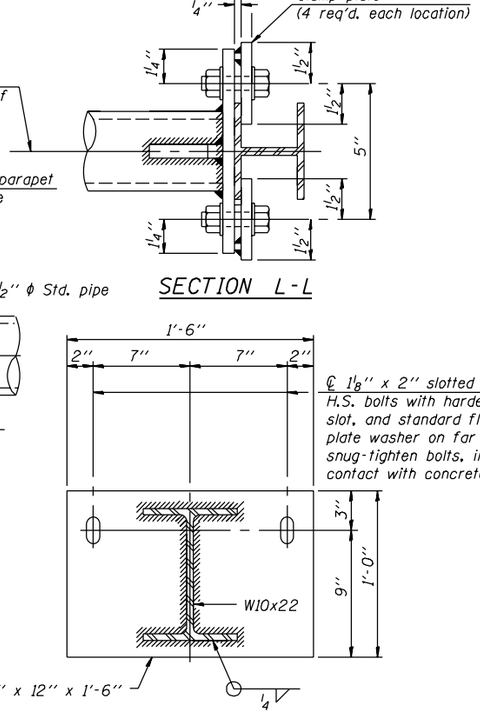


SECTION H-H



DETAIL B - ALTERNATE BOLTED W10x22 TO W6x12 CONNECTION

Alternate may be substituted by contractor to facilitate construction or galvanizing, especially on long struts for skewed bridges.

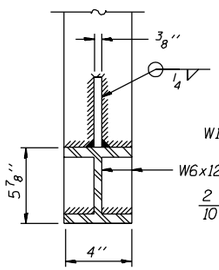


SECTION L-L

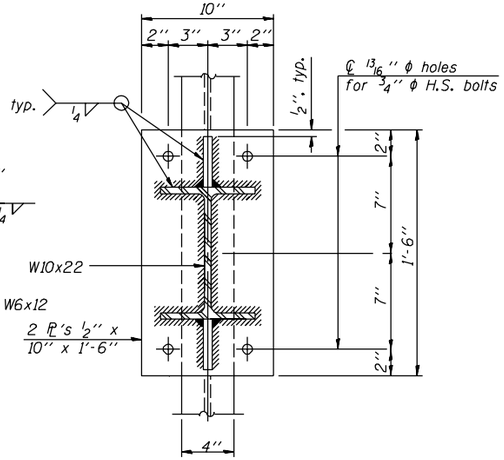
SECTION D-D

Concrete beam or girder connection plate details.

℄ 1 1/8" x 2" slotted holes in plate for 1" ϕ H.S. bolts with hardened plate washer over slot, and standard flat washer and 4" x 4" x 1/2" plate washer on far end. Use locknuts and only snug-tighten bolts, insuring pad is in uniform contact with concrete before tightening begins.



SECTION J-J



SECTION I-I

BRIDGE MOUNT SIGN STRUCTURES
CONNECTION DETAILS

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

\- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

BM-3 7/01/2006

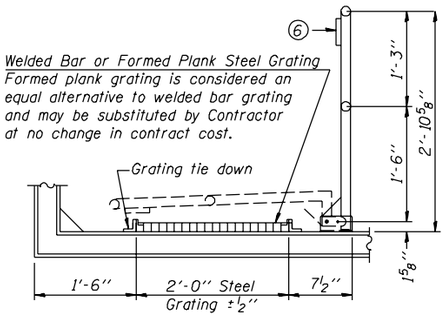
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

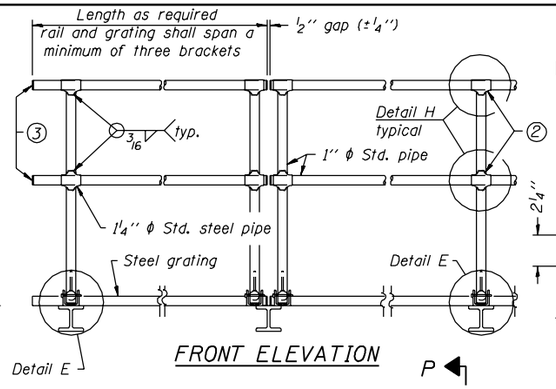
SHEET NO. - - SHEETS

Contract #

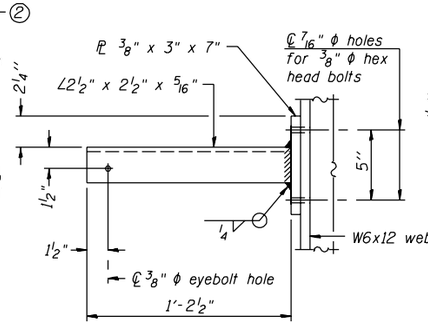
Welded Bar or Formed Plank Steel Grating
Formed plank grating is considered an equal alternative to welded bar grating and may be substituted by Contractor at no change in contract cost.



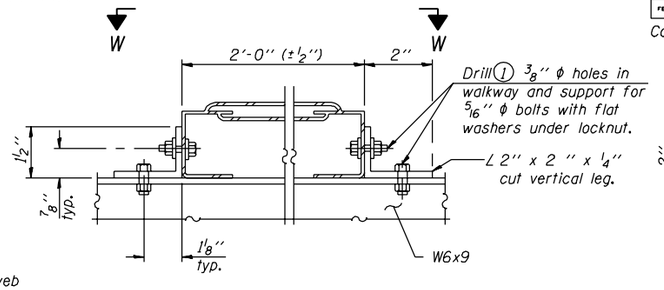
SIDE ELEVATION



FRONT ELEVATION

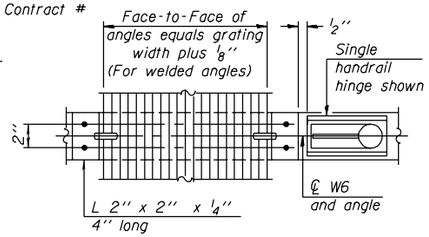


SECTION P-P

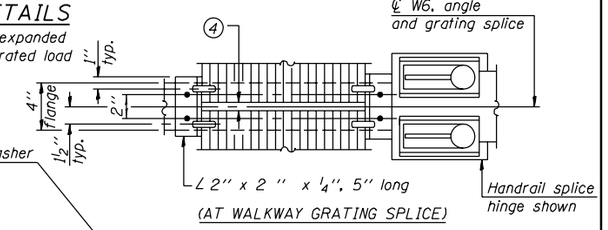


ALTERNATE FORMED PLANK GRATING DETAILS

Plank Grating: nominal depth = 2½" (±½"); perforated or expanded steel sheet with a non-skid surface (non-serrated) concentrated load capacity = 500 lbs. with 6'-0" clear span.

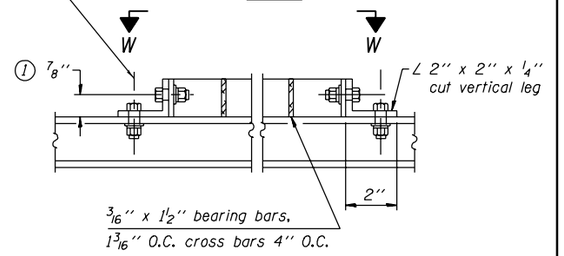


(WALKWAY GRATING CONTINUOUS)

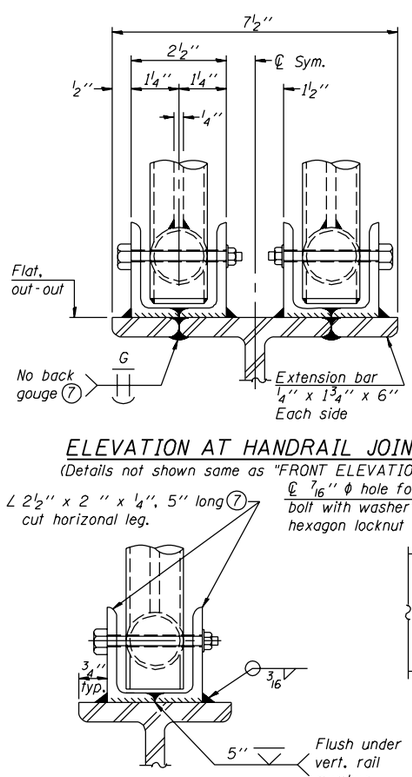


(AT WALKWAY GRATING SPLICE)

PLAN



WELDED BAR GRATING DETAILS

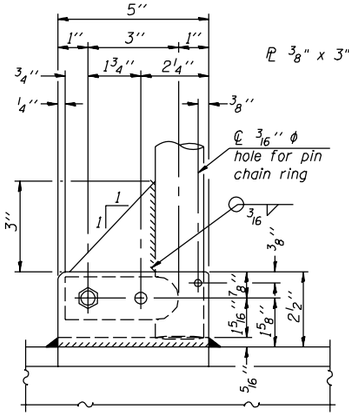


ELEVATION AT HANDRAIL JOINT

(Details not shown same as "FRONT ELEVATION")

FRONT ELEVATION

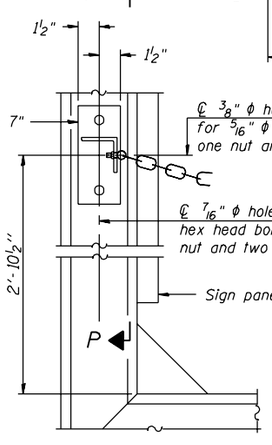
(See above Elevations for dimensions.)



SIDE ELEVATION

PLAN AT SINGLE HANDRAIL HINGE

DETAIL E

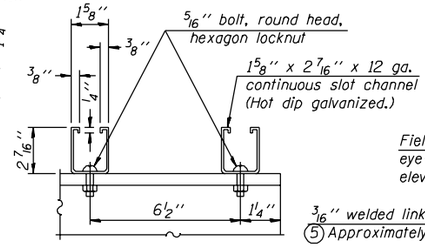


SAFETY CHAIN ATTACHMENT

(With Sign Present)
Items not shown same as "SIDE ELEVATION" and "SAFETY CHAIN"

PLAN AT HANDRAIL JOINT

(For Details, see Elevations.)

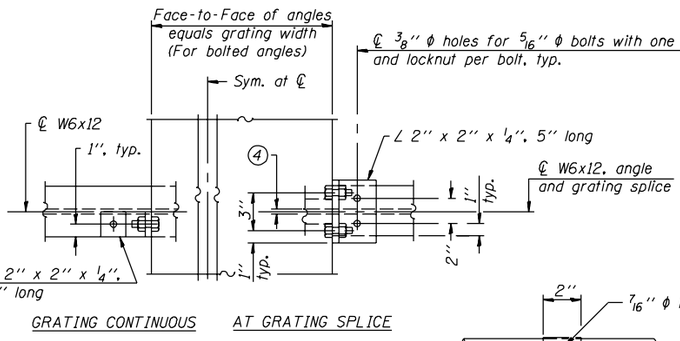


SECTION F-F

LIGHTING FIXTURE MOUNTS

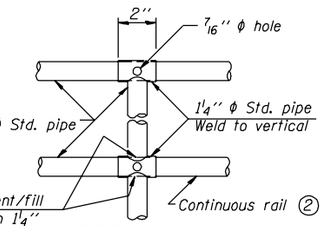
(If required)

NOTES



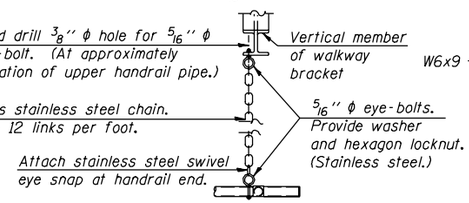
GRATING CONTINUOUS AT GRATING SPLICE

VIEW W-W



DETAIL H

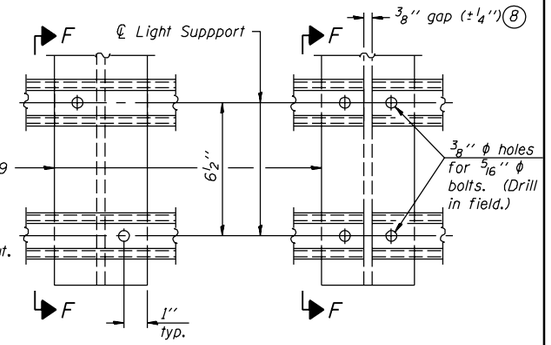
Welds 3/16" continuous



No Sign at Bracket

SAFETY CHAIN

One (1) required for each end of each walkway.



DETAIL F DETAIL G

NUMBER	REVISION	DATE

DESIGNED -
CHECKED -
DRAWN -
CHECKED -

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

BM-4 7/01/2006

① Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment. Field drilled holes must be touched up with galvanized paint.

② Horizontal rail member shall be continuous thru 1¼" ϕ pipe. Provide 7/16" ϕ hole in 1¼"ϕ pipe for ⅜" ϕ bolt. Field drill 7/16" ϕ hole in horizontal rail member. Provide washer and locknut for bolt. (Use 5/16" eyebolts in 7/16" ϕ holes on top rail at ends only.)

③ Install standard force-fit end caps or weld ⅛" end plates with ⅛" c.f.w. and grind smooth. (All rail ends.)

④ ⅜" (±¼") gap between grating panels at splice.

⑤ Chain to be type 304L stainless steel suitable for prolonged exterior exposure. Approximately 3'-6" long chain per location. Maximum sag with handrail erected = 4".

⑥ PL ⅛" x ½" x 2" welded to handrail posts to protect locations that contact grating.

⑦ Extrusions may be used in lieu of details shown, with approval by Engineer.

⑧ Field cut ends of light support channels shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.

BRIDGE MOUNT SIGN STRUCTURES
WALKWAY DETAILS